

- 1) An electrical firm manufactures light bulbs that have a length of life that is normally distributed with standard deviation of 40 hours. If a sample of 30 bulbs has an average life of 780 hours,
 - a) Find a 96% confidence interval for the population mean of all bulbs produced by this firm.
 - b) How large a sample is needed if we wish to be 96% confident that our sample mean will be within 10 hours of the true mean?

- 2) The heights of a random sample of 50 college students showed a mean of 174.5 cms, and a standard deviation of 6.9 cms.
 - a) Construct a 98% confidence interval for the mean height of all college students.
 - b) What can we assert with 98% confidence about the possible size of our error if we estimate the mean height of all college students to be 174.5 cms?

- 3) In a batch chemical process, two catalysts are being compared for their effect on the output of the process reaction. A sample of 12 batches were prepared using catalyst 1, and a sample of 10 batches was obtained using catalyst 2. The 12 batches for which catalyst 1 was used gave an average yield of 85 with a standard deviation of 4, and the second sample gave an average yield of 81 and a standard deviation of 5.
 - a) Find a 90% confidence interval for the difference between the population means.
 - b) What assumptions did you use?
 - c) Interpret the interval.

- 4) In a random sample of 1000 homes in Al-Khobar, it is found that 228 are heated by oil.
 - a) Find a 99% confidence interval for the proportion of homes in Al-Khobar that are heated by oil.
 - b) How large a sample is needed if we wish to be 99% confident that our sample proportion will be within 0.05 of the true proportion of homes in Al-Khobar that are heated by oil?

- 5) Compute a 98% confidence interval for the proportion of defective items in a process when it is found that a sample of 100 yields 8 defectives?
 - a) How large a sample is needed if we wish to be 98% confident that our sample proportion will be within 0.05 of the true proportion defectives, if we do not have a prior estimate of the proportion?